

Appl. No. 10/576,070
Amdt dated February 8, 2008
Reply to Office action of November 9, 2007

REMARKS

Claims 11-21 are now in this application.

Claim 11 has been amended to overcome the rejection of claims 11-20 for failing to provided proper antecedent basis for “the needle parts” and “outer and inner needle parts”.

Claim 21 has been added to clarify that the booster chamber 17 acts upon a first control chamber and the other booster chamber 13 acts on a second control chamber 20.

In the Office action of November 9, 2007, the examiner rejected claims 11-20 as unpatentable over Tsumura et al in view of Schechter et al. However, in making this rejection the examiner has not read the Tsumura et al reference correctly. Claim 11 calls for a multi-part injection valve member having an inner needle part and an outer needle part. To fulfil this recitation of claim 11, the “outer” part 22 of Tsumura et al would have to cover and uncover at least one injection opening. Otherwise, it is not a valve member.

In Tsumura et al an “outer piston 22” is integral with piston stem 38, and the “inner,” part 60 is the only valve member. There is no outer needle part which is a valve member as required in claim 11, which states in lines 3-4, “a multi-part injection valve member having an inner needle part and an outer needle part”. While in Tsumura et al there may be an outer part 60, it is **not** part of a valve member, and it certainly is **not** an outer needle member 60. In Tsumura et al the outer part 22 does **not** cover, and does **not** close any injection openings as is required for the needle as recited in the language of claim 11 for applicant’s outer needle part.

Further in Tsumura et al, there clearly is no first booster chamber hydraulically connected to a second control chamber which actuates the outer needle part as recited in claim 11. This is

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clearly true as there is no outer needle part. The part which the examiner has looked at in this regard in Tsumura et al is part 22. But this part 22 is integral with stem 38, and is actuated there-through by rocker arm 52. It is not a needle, or any part of a multi-part injection valve member as required by claim 11. Part 22 of Tsumura et al does not cover or uncover any injection openings as required by the language of claim 11 by the fact of its being an injection valve member.

Furthermore, the Tsumura et al reference does not disclose a fuel injector whose injection valve member has two needle parts. The sole needle part of the injection valve member of the Tsumura et al reference is element 60. This is the only this needle part which acts to open and close injection opening 78. The outer piston 22 acts neither to close, nor to open injection openings, and in this respect is not a needle part.

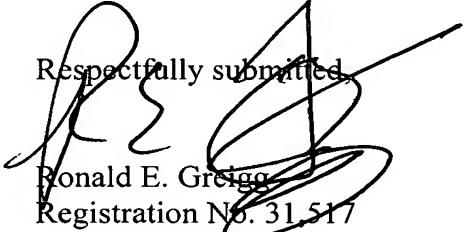
The outer piston 22 of Tsumura et al, in contrast to being a nozzle needle which opens and closes injection ports, performs the task of sliding down around needle part 60, and in so doing it compresses the mixture in pressure chamber 24 to a point where, as outer part 22 continues downwardly sufficiently it pushes nozzle needle 60 until reduced diameter section 76 extends through bore 78, at which time the air-fuel mixture compressed in chamber 24 is expelled through the nozzle needle passage 82 and spray holes 80. As a pressure piston, outer member 22 generates the injection pressure by reducing the size of the premixing chamber 24. It is not a needle which opens and closes injection openings.

The Schechter et al reference also does not disclose a fuel injector having two needle parts guided coaxially one inside the other. Thus, the Schechter et al reference cannot be

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combined with the Tsumura et al reference to provide a valid rejection of the claims, as neither reference teaches the structure as recited by claim 11 and the claims which depend on it. For this reason, as well as the reasons given above regarding the Tsumura et al reference, the combination of the Tsumura et al and Schechter references does not make a proper combination for the rejection of applicant's claims. This combination, as proposed by the examiner, does not meet all of the limitations of the claims.

For the above reasons, entry of the amendment and allowance of the claims are courteously solicited.


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